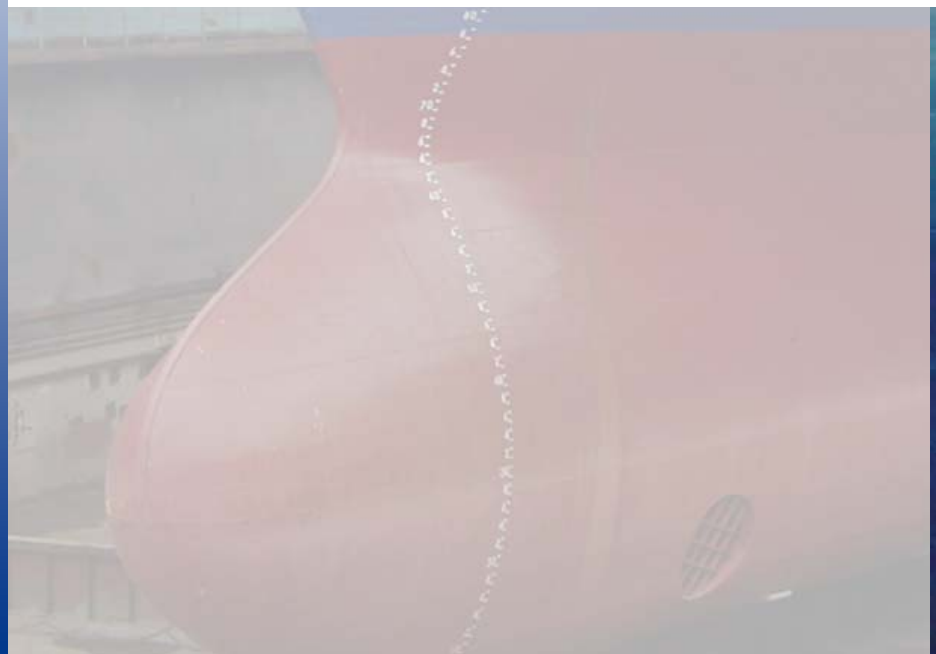
Centre of Maritime Research in Elsfleth

BELUGA SHIPPING

Beluga Shipping - Research & Innovation
Centre of Maritime Research in Elsfleth



as at
04/02/2010

Current research projects

running projects

planned projects

MSTC/Offshore & Heavy Lift Crane Simulation
Offshore Safety Training, development and construction of a crane operation simulator

WINTECC / SkySails
Innovative wind propulsion technology for cargo ships

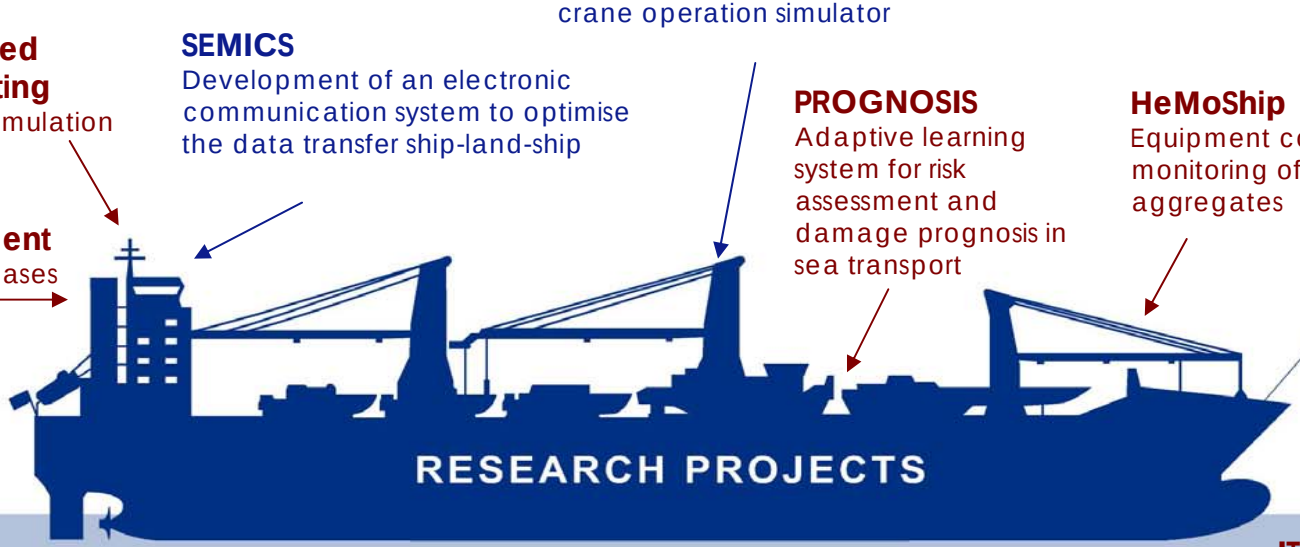
Satellite-based weather routing
Real-time ice simulation

SEMICS
Development of an electronic communication system to optimise the data transfer ship-land-ship

PROGNOSIS
Adaptive learning system for risk assessment and damage prognosis in sea transport

HeMoShip
Equipment condition monitoring of maritime aggregates

Emission measurement
Monitoring of exhaust gases from ships



SeaRack
Development of (multipurpose) loading equipment for offshore wind turbines

SatMes
Ocean current analysis

IT-based 3D-freighting
Optimisation/ Automation of the freighting process

Waste heat recovery
Using waste heat from the ship propulsion system for power generation

HAI-TECH
Low-friction surfaces due to innovative coatings

e4ships
Fuel cells as environmentally friendly propulsion systems of the future

Northern Sea Route
Optimisation of the Northern Sea route transits as requirement for an economic passage

Mon²Sea real-time monitoring
Cargo tracing project from production to offshore installation worldwide

SystOP Offshore Wind
Optimisation of the complete logistics supply chain offshore wind farm

SystOP Offshore Wind
BMU project

Optimisation of the logistics supply chain offshore wind farm

Motivation

- Developing a transparent and dynamic supply chain offshore wind farm

Objectives of SystOP Offshore Wind

- Modelling and simulation to identify weaknesses and risks of error
- Process optimisation and risk management
- Advancing suggestions for manufacturer-independent operation and maintenance procedures for offshore wind farms
- Supporting operators, project partners, investors et al. in planning and developing an efficient and optimal operation and maintenance for a fail-safe offshore wind farm

Project start: January 2010 (Kick-off on Nov 20th 2009)

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Information & Communication Technologies

Ship Technology

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SystOP Offshore Wind

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Information & Communication Technologies

Ship Technology

Further positive effects

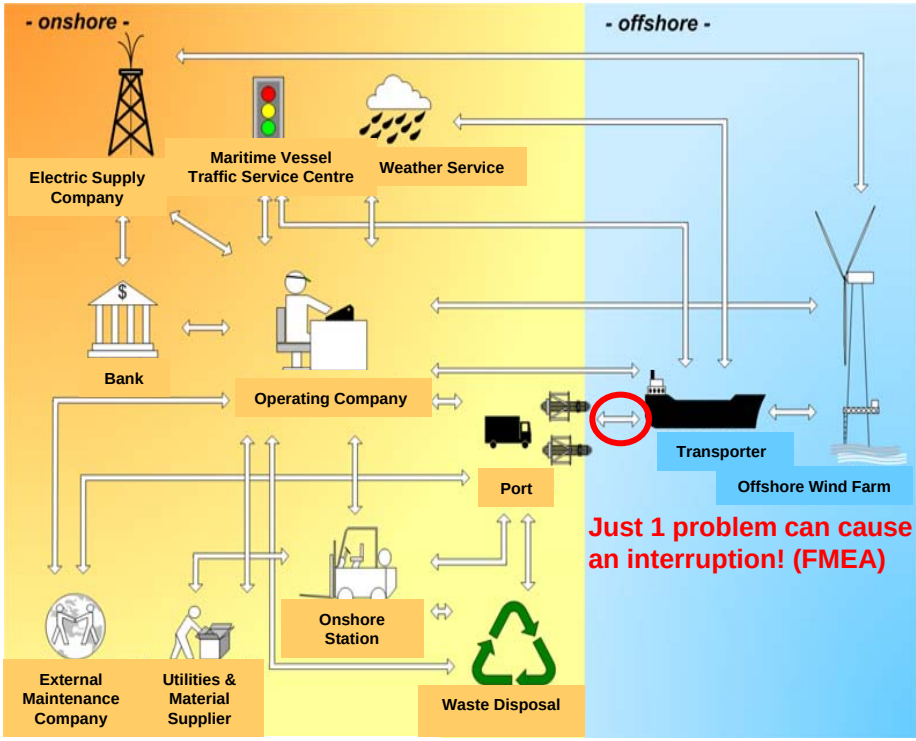
- Networking with Key-Players in the offshore sector
- Use of results and transfer of know-how in all directions

Applicant/ Project coordinator

University of Applied Sciences Bremen, Institute for Environmental Engineering and Biotechnology

Cooperation partner

Philotech GmbH



Example: Transfer of gears

Project partners

EWE | BTC | Bremer Landesbank | Roland Offshore | IZP Dresden | DEWI-OCC | REETEC | Bugsier-Reederei | FRI.KING | Prokon Nord | WindMW | Beluga Hochtief Offshore | Beluga Shipping | et. al.

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SEMICS
Smart Electronic Maritime Information and Communication System

SEMICS
BMBF project

Development of an Electronic Information and Communication System for Data Transfer on Cargo Ships

SEMICS = Smart Electronic Maritime Information and Communication System

Objectives of SEMICS

- Reduction of administrative work for ships personnel
- Paperless and legally compliant electronic document management
- Transparent and semi-automatic processes
- Improved communication between the head office on shore and the vessels
- Increased ship and occupational safety on board as the crew members can concentrate on their core duties

Project duration: 09/01 2008 – 08/31 2011

Costs: 6 Mio. €

Funding BMBF: 3 Mio. €

www.semics.de/en

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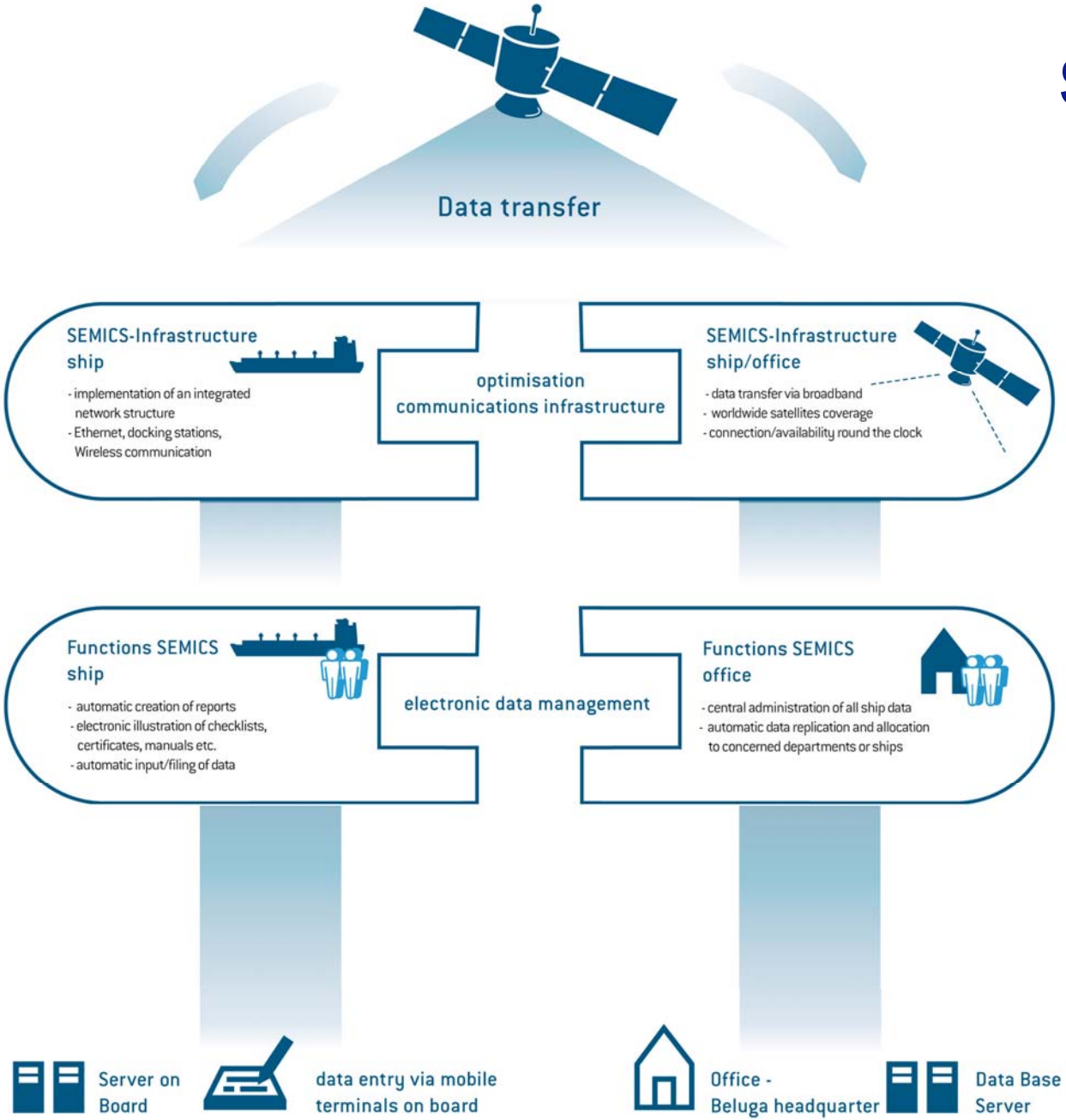
SEMICS



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SatMeS

funded by the EU/Federal Land of Bremen

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Satellite supported ocean current analysis for the optimisation of sea routes and fuel savings on ships

Today's ship route planning already takes global water current maps into account. However, these maps are based on empirical data and averaged spot measurements, accordingly they are imprecise.

Objectives of the project

- Application of the latest satellite technology (e. g. TerraSAR-X) for a high resolution analysis of local water currents
- Integration of the information into optimal route planning, especially to avoid frontal water currents in order to decrease fuel and emissions

Project duration: 02/01 2009 – 01/31 2011

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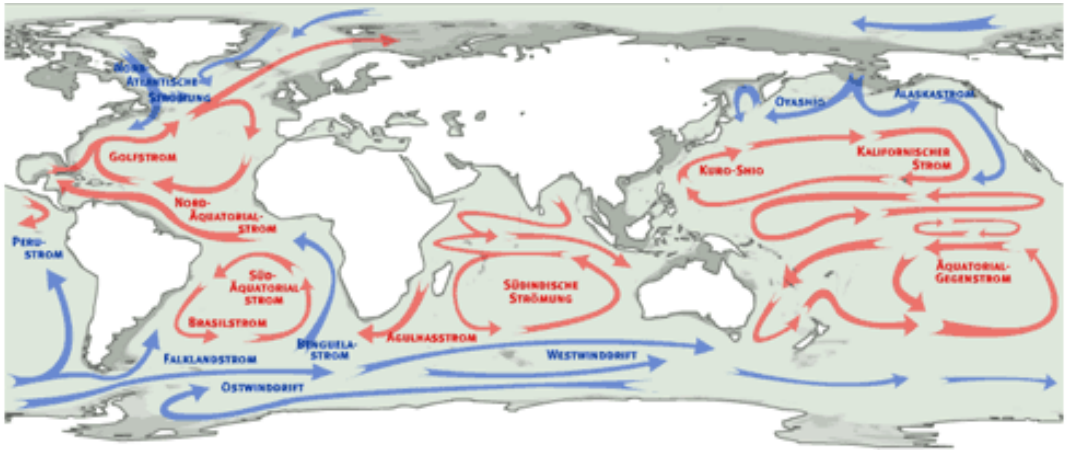
SatMeS



Consortium

GAUSS Environmental Protection and Safety in Shipping | German Aerospace Center (DLR) Oberpfaffenhofen | Beluga Shipping GmbH | Carl Büttner GmbH & Co. KG | German Tanker Shipping GmbH & Co. KG | Team Ship Management GmbH & Co. KG

Associated partners

Deutscher Wetterdienst (DWD)

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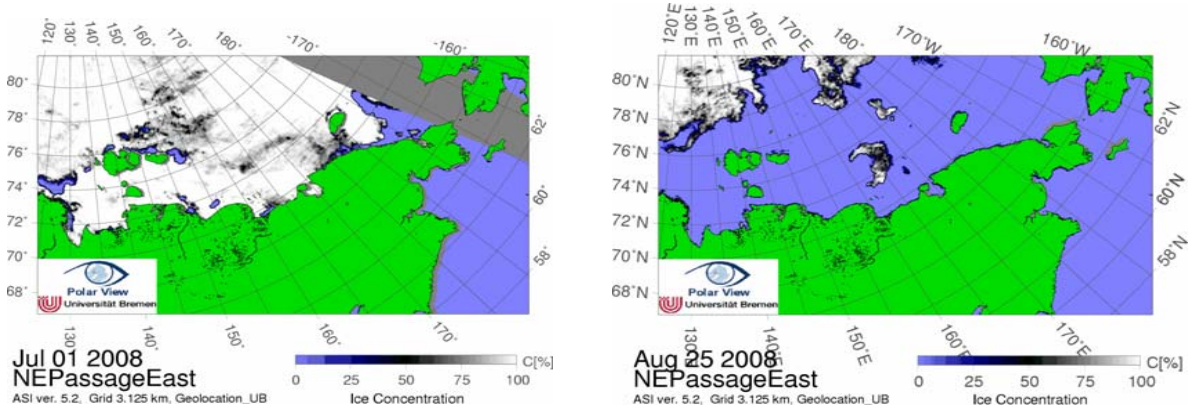
Northern Sea Route

BMWi project

Optimisation of the Northern Sea Routes as Requirement for an Economic Passage

As a **result of climate change,** the sea ice coverage in the Arctic Sea decreased by about 25 percent. This enables the shipping companies to use shorter routes between Europe and Asia for the economic transportation of goods.



Objectives of the German Russian project:

- Combination of meteorological, oceanographic and ice dynamic forecasting models to a short-term ice-prediction model
- Communication of optimal routes via modern satellite information systems on short time-scales

Project start: 05/01 2010 (prospective)

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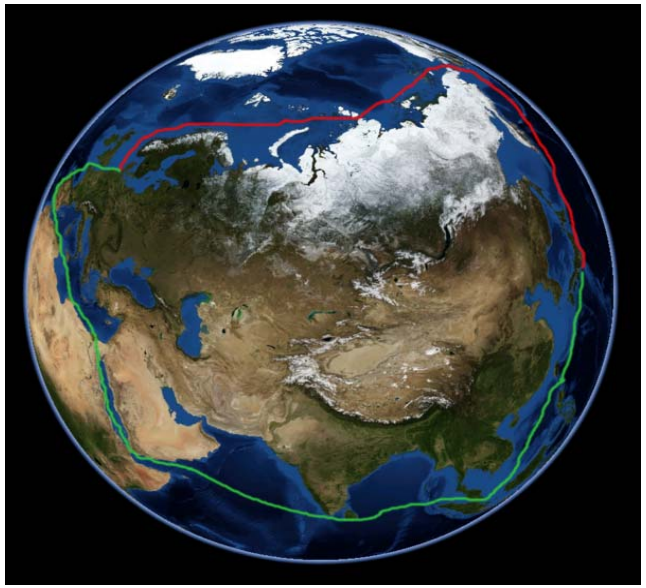

Northern Sea Route

German Russian project

Sea Route Bremen-Masan (South Korea):

1. Northeast Passage (red line)
   7.360 nm
2. Suez Canal (green line)
   10990 nm

Project partners

Germany. Alfred-Wegener-Institut für Polar- und Meeresforschung – AWI | Beluga Fleet Management GmbH & Co. KG | Bundesamt für Seeschifffahrt und Hydrographie – BSH | Deutscher Wetterdienst, Hamburg – DWD | FastOpt GmbH, Hamburg | Hamburgische Schiffbau Versuchsanstalt GmbH – HSVA | Institut für Meeresforschung der Universität Hamburg – IfM | Meteorologisches Institut der Universität Hamburg – MI | Institut für Umweltphysik der Universität Bremen – IUP | O.A.Sys GmbH, Hamburg | Phoenix Reederei Bereederungs GmbH & Co. KG, Leer | Reederei F. Laeisz GmbH, Bremerhaven/Rostock | TRANSAS Europe GmbH Hamburg –TRANSAS | Dr.-Ing. Joachim Schwarz, JS-Consultant; Projektkoordinator

Russia. Arctic and Antarctic Research Institute – AARI | Central Marine Research and Design Institute, CNIIMF| Northern Sea Route Administration / Morflot, Moskau | Murmansk Shipping Company Sovcomflot, St. Petersburg | TRANSAS, St. Petersburg | Non-Commercial Partnership of the Coordination of the NSR-Usage, Vladimir Mikhailichenko

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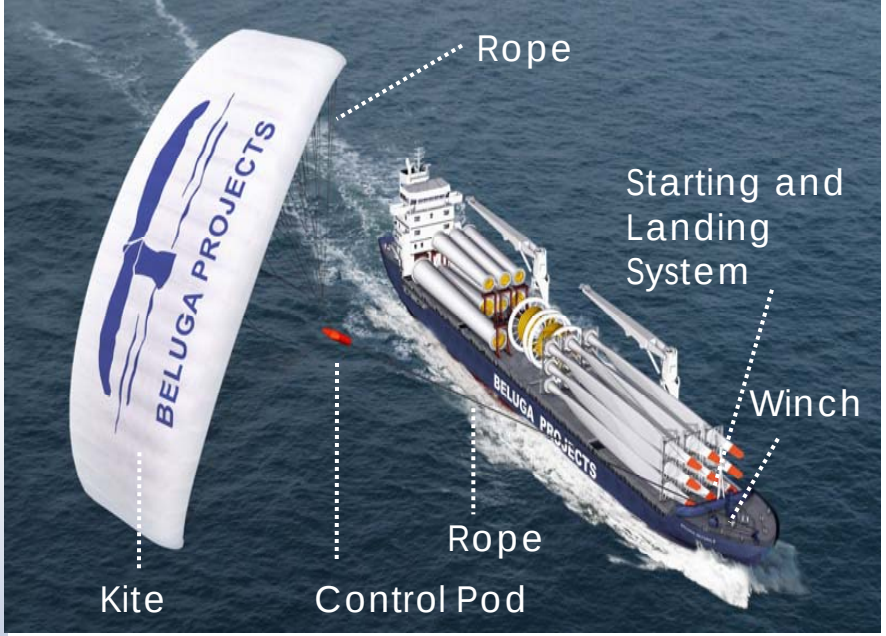

WINTECC

WINTECC
EU project

Innovative Wind Propulsion Technology for Cargo Ships

- Ideal adjustment of the kite in consideration of wind direction, wind force, direction of the ship‘s course and its speed
- Ready for use at a speed of 4-5 m/s or more
- Rope length up to 300 meters
- Automatic positioning
- Dynamic movement of the kite in the form of an „8“ generating substantial driving force
- Possible speed of up to 50 m/s

Project duration: 01/01 2006 – 12/31 2009

www.wintecc.de/en

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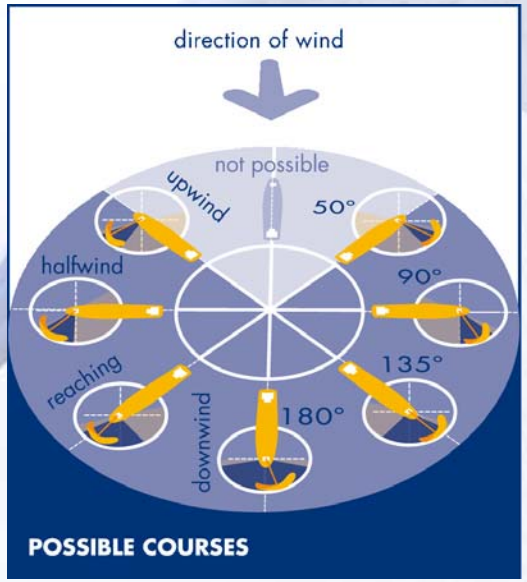
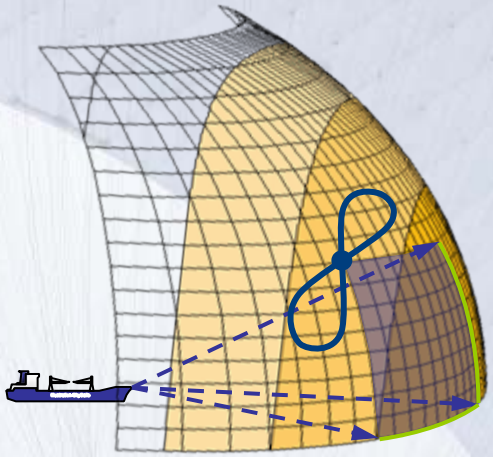
BELUGA SHIPPING

WINTECC

Innovative Wind Propulsion Technology for Cargo Ships





Maritime Logistics

Information & Communication Technologies

Ship Technology

Project partners

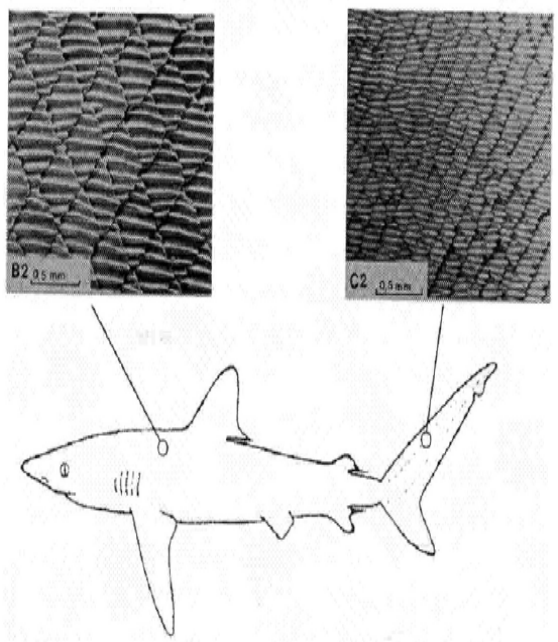
Beluga Fleet Management | SkySails | OceanWaveS | Aldebaran Marine Research & Broadcast

HAI-TECH
BMWi project

Low-Friction Surfaces Due to Innovative Coatings

Objectives of HAI-TECH

- Development of a low-cost system solution for ship hull coatings with a sharkskin structure
- Significant reduction of fuel consumption of ships due to low resistance
- Reduction of atmospheric emissions of greenhouse and acidic rain gases



Major side effects

- Increased speed of the vessels
- Noise reduction

Project duration: 09/01 2008 – 08/31 2011

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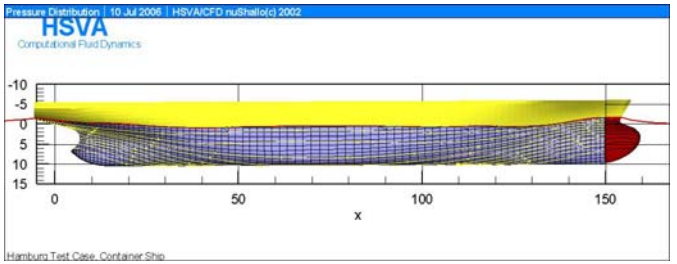
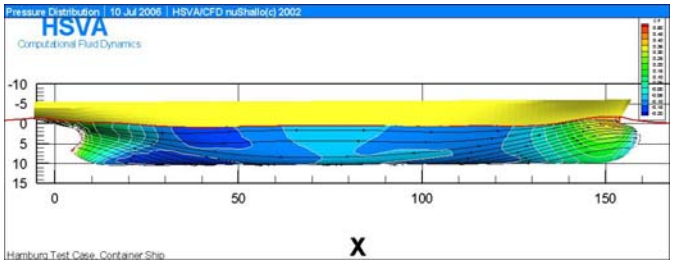
HAI-TECH





Applicant / Project coordinator

Fraunhofer Institute for Manufacturing Engineering & Applied Materials Research

Project partners

Blohm + Voss | Fahrion Engineering | Nordseewerke | Beluga Fleet Management | HSVA – Hamburg Ship Model Basin

Maritime Logistics

Information & Communication Technologies

Ship Technology

Climate-KIC
EU project

„Creating a Knowledge and Innovation Community (KIC) to address Climate Change Mitigation and Adaptation“

The fight against climate change requires radical transformation in the global economy. To meet the challenges, the three elements of the knowledge triangle (higher education, research and business-innovation) must be fully integrated.

Objectives of the Climate-KIC

- Bringing together excellence in European higher education, research and business in a truly integrated manner to meet climate change with the innovations that are needed
- Advancing research, (further) education and entrepreneurship in areas that are central to climate change mitigation and adaptation
- Using synergies and fostering interdisciplinary cooperation in the matter of climate protection at the international level

Climate-KIC

Research focus for Beluga in the Climate-KIC

- Energy efficiency in the transport sector and in shipping in particular
- Reduction of fuel consumption and alternative propulsion systems
- Monitoring and reduction of CO_2-emissions in the shipping sector

Consortium

ETH Zurich | Imperial College | Potsdam Institute for Climate Impact Research | German Research Centre for Geosciences | TU Berlin | TU Munich | Institut Pierre Simon Laplace | ParisTech | UVSQ | CEA | INRA | MeteoFrance | Advancity | Utrecht University | Delft University | Wageningen University | Bayer | Beluga Shipping | CISCO | DSM | Électricité de France | SAP | Schiphol Group | Shell | Solarvalley | Thales | further regions and project partners

in the planning stage

- **Health Monitoring – HeMoShip**
  Equipment condition monitoring of maritime aggregates using bow thruster and main gear box as examples
- **Mon²Sea real-time monitoring**
  Cargo tracing project from production to offshore installation worldwide
- **SeaRack**
  Development of (multipurpose) loading equipment for offshore wind turbines
- **IT-based 3D-freighting**
  Developing a software tool for the automatic freighting of heavy lift carriers
- **PROGNOSIS**
  Developing an adaptive learning system for risk assessment and damage prognosis in sea transport
- **Satellite-based weather-routing**
  Real-time ice simulation
- **Emission measurement**
  Monitoring of exhaust gases from ships
- **Waste heat recovery**
  Using waste heat from the ship propulsion system for power generation

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Maritime Campus in Elsfleth

Vocational Training

- Operation of the ship mechanic centre with residential school for 80 apprentices
- In development: Maritime Safety Training Centre & Offshore / Heavy Lift Crane Operation Simulator

University, Research and Teaching

- Extension building of the Jade University of Applied Sciences Wilhelmshaven / Oldenburg / Elsfleth (Department of Nautical Studies)

Applied Maritime Research

- Operation of the Maritime Research Centre

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Centre of Maritime Research in Elsfleth

The Centre of Maritime Research serves as a platform for applied research in the field of shipping and ocean technology. Its purpose is to initiate and oversee projects which are conducted in conjunction with maritime institutes, universities, shipyards, shipping lines and private enterprise.

Applied research.	Cooperation of science and industry. Specific aspects of operational business are examined, elaborated and further developed on a practical basis.
Setting highlights.	Initiation and performance of research projects.
Knowledge transfer.	Enhancing knowledge and technology transfer for the effective use of research results.
Realising synergies.	Bundling of competencies and resources in order to realise synergies between teaching, education and research.
Enhancing cooperation.	Attracting renowned research institutes and maritime industries and partners to work on the campus.

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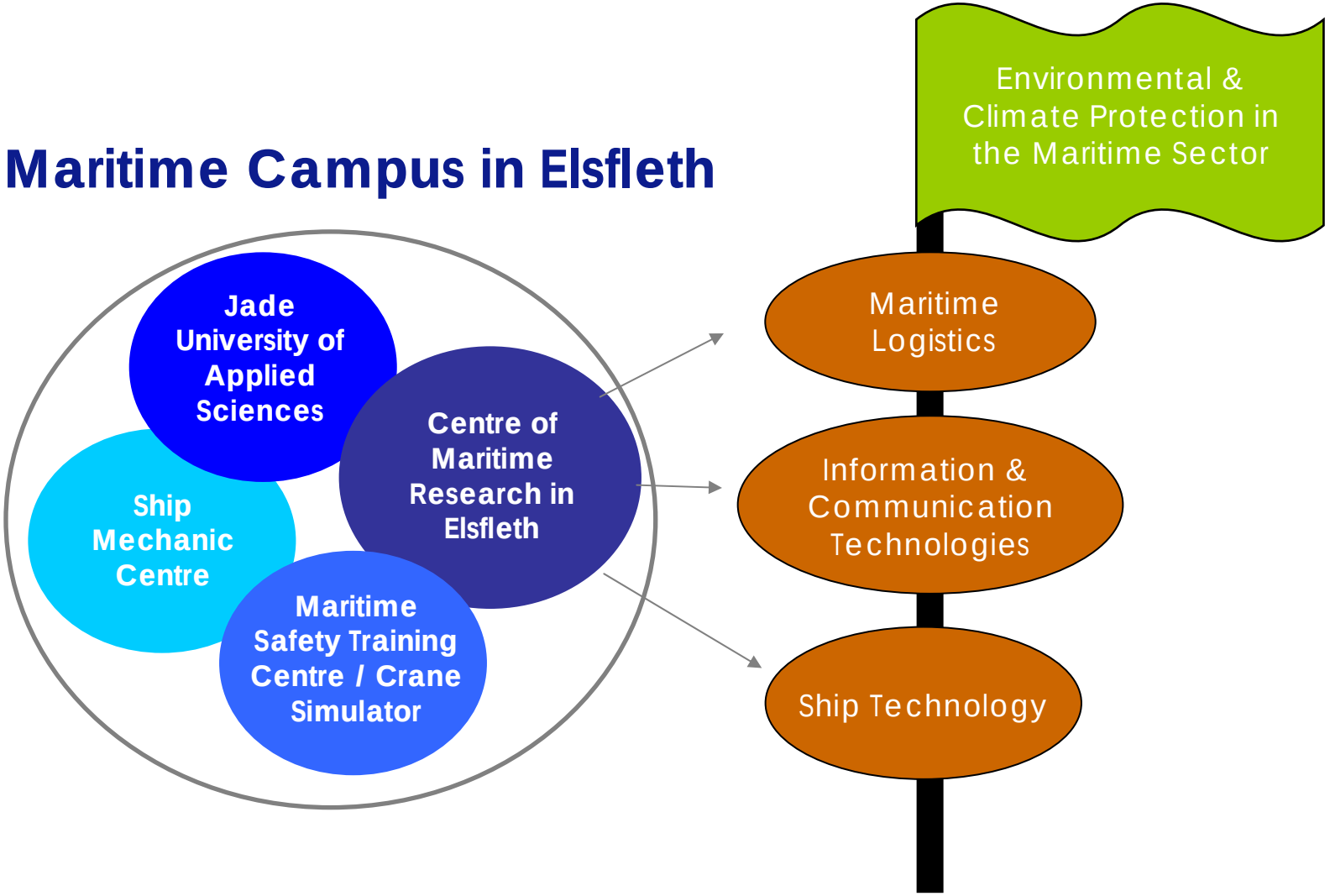
Research fields

Maritime Campus in Elsfleth



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Partners

Partners:

- Aktiengesellschaft Reederei Norden Frisia
- Beluga Shipping GmbH
- Centre of Maritime Research in Elsfleth
- GAUSS Environmental Protection and Safety in Shipping
- Institute for Maritime Simulation (IfmS) / University of Applied Sciences Bremen
- Institute of Shipping Economics and Logistics (ISL)
- Jade University of Applied Sciences Wilhelmshaven / Oldenburg / Elsfleth
- Oldenburg Research and Development Institute for Information Technology Tools and Systems (OFFIS)
- Rheinmetall AG
- Sky Sails GmbH & Co. KG
- Technologiebroker Bremen GmbH
- Uwe Kloska GmbH
- Zeit & Service Beschäftigungsfördergesellschaft mbH

Reserved:

- Potsdam Institute for Climate Impact Research (PIK)
- Wirtschaftsförderung Wesermarsch

Contact

Dr. Ralf Wöstmann
Head of Department „Research & Innovation“
Managing Director Centre of Maritime Research in Elsfleth

E-Mail ralf.woestmann@beluga-group.com
Phone +49 (0) 421 - 333 22 180
Mobile +49 (0) 0163 - 606 04 45

Administration
Teerhof 59
D-28199 Bremen